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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Sixty-fourth Meeting
Montreal, 25-29 July 2011

PROJECT PROPOSAL: CAMEROON

This document consists of the comments and recommendation of the Fund Secretariat on the following project proposal:

Phase-out

- HCFC phase-out management plan (stage I, first tranche) UNIDO

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS
Cameroon

(I) PROJECT TITLE	AGENCY
HPMP	UNIDO (lead)

(II) LATEST ARTICLE 7 DATA	Year: 2009	104.2 (ODP tonnes)

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)									Year: 2010
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab Use	Total sector consumption
				Manufacturing	Servicing				
HCFC123									
HCFC124									
HCFC141b		12.4				3.5			15.9
HCFC142b									
HCFC22				5.0	33.2	28.9			67.1

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline (estimate):	93.7	Starting point for sustained aggregate reductions:	82.4
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	0.0	Remaining:	57.1

(V) BUSINESS PLAN		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
UNIDO	ODS phase-out (ODP tonnes)	12.0		0.8	0.2							13.0
	Funding (US $)	1,035,387	0	89,206	21,102	0	0	0	0	0	0	1,145,695

(VI) PROJECT DATA			2011	2012	2013	2014	2015	Total
Montreal Protocol consumption limits (estimate)			n/a	n/a	93.7	93.7	84.3	
Maximum allowable consumption (ODP tonnes)			n/a	n/a	82.4	82.4	74.2	
Project Costs requested in principle(US$)	UNIDO	Project costs	884,453		180,000		118,272	1,182,725
		Support costs	66,334		13,500		8,870	88,704
Total project costs requested in principle (US $)			884,453	0	180,000	0	118,272	1,182,725
Total support costs requested in principle (US $)			66,334	0	13,500	0	8,870	88,704
Total funds requested in principle (US $)			950,787	0	193,500	0	127,142	1,271,429

(VII) Request for funding for the first tranche (2011)		
Agency	**Funds requested (US $)**	**Support costs (US $)**
UNIDO	884,453	66,334

Funding request:	Approval of funding for the first tranche (2011) as indicated above
Secretariat's recommendation:	Individual consideration

PROJECT DESCRIPTION

1. On behalf of the Government of Cameroon UNIDO, as the designated implementing agency, has submitted to the 64th meeting of the Executive Committee stage I of the HCFC phase-out management plan (HPMP) at a total cost of US $2,479,196 plus agency support costs of US $185,940, as originally submitted. Implementation of the activities proposed in stage I of the HPMP will result in the phase-out of 28.9 ODP tonnes of HCFCs, comprising 21.1 ODP tonnes (383.6 metric tonnes (mt)) of HCFC-22 and 7.8 ODP tonnes (71.0 mt) of HCFC-141b. It covers the 10 per cent reduction by 2015 and 35 per cent reduction in consumption by 2020.

2. The first tranche for stage I being requested at this meeting amounts to US $1,084,696 plus agency support costs of US $81,352 for UNIDO, as originally submitted.

Background

3. Cameroon, with a total population of about 19.4 million inhabitants, has ratified all the amendments to the Montreal Protocol. Given its CFC compliance baseline of 256.9 ODP tonnes Cameroon was categorized as a low-volume-consuming country (LVC). However, considering the HCFC estimated compliance baseline of 93.7 ODP tonnes (1,458.5 mt), Cameroon can no longer be categorized as an LVC country.

ODS regulations

4. Since 1995, the Government of Cameroon has enacted ODS regulations through ministerial orders by the Ministry of Environment and the Protection of Nature and the Ministry of Industrial and Commercial Development, including control of imports of ODS and ODS-based equipment. The process for importing ODS involves three main parties, the customs department, the *Société de Surveillance Générale (SGS)* and the National Ozone Unit (NOU), which has been delegated the responsibility to implement the Montreal Protocol, including issuance of import quotas. The licensing system has successfully been implemented focusing mainly on CFCs; however, further improvement of the customs classifications system to also include blends, and training for the customs officers and inspectors is required to effectively control HCFCs. A quota system for HCFCs will be operational by 2013.

HCFC consumption and sector distribution

5. HCFC-22 and HCFC-141b are the only two HCFCs imported into the country. According to the survey conducted for the preparation of the HPMP, between 2005 and 2010 the consumption of HCFC-22 fluctuated between 63.2 and 69.2 ODP tonnes, while the consumption of HCFC-141b decreased from 25.0 ODP tonnes to 15.9 ODP tonnes over the same period. Table 1 shows the consumption of HCFCs in Cameroon as presented in the HPMP.

Table 1. HCFC consumption in Cameroon (2005-2010)

Year	Data from survey HPMP			Article 7 data
	HCFC-22	HCFC-141b	Total	
Metric tonnes				
2005	1,159	227	1,386	80
2006	1,257	257	1,514	170
2007	1,258	267	1,525	185
2008	1,150	257	1,407	234
2009	1,206	140	1,346	1,551
2010	1,221	145	1,366	N.A.

ODP tonnes				
2005	63.7	25.0	88.7	4.4
2006	69.1	28.3	97.4	9.4
2007	69.2	29.3	98.5	11.6
2008	63.2	28.2	91.4	14.8
2009	66.3	15.4	81.7	104.2
2010	67.1	15.9	83.1	N.A.

6. HCFC-22 is mainly used for servicing refrigeration and air-conditioning equipment (93 percent of the total use), and manufacturing or assembly of refrigeration and air-conditioning equipment. Manufacturing is concentrated in twelve small and medium-scale enterprises, the majority of which also operate as refrigeration and air-conditioning servicing and installation contractors. A limited range of display cases, condensing units, spilt-air-conditioning systems, cold rooms and custom-specific systems are manufactured to the enterprise's own design by request, often with individual modifications to suit the customer's requirements. Most equipment is produced using a mixture of imported and locally made components, some of which are recycled from redundant equipment and systems. Assembly is done in multipurpose workshops with basic fabrication tools and equipment. Some of the larger workshops own charging equipment whilst others use vacuum pumps, pressure gauges and weighing scales to achieve the specific charge levels.

7. HCFC-141b is used as a foam blowing agent to produce rigid polyurethane foam for cold water pipes, or for commercial refrigeration units; and as a solvent to degrease refrigeration and air-conditioning systems after manufacturing and for cleaning of electronic and mechanical parts in several sectors. The manufacturing of polyurethane rigid insulation foam for cold water pipes is done by six companies *in situ*. Three of these companies also manufacture foam panels required in commercial refrigeration units by hand mixing and using locally adapted low-pressure foaming machines. Three additional companies used HCFC-141b in the manufacturing of flexible slabstock foam and converted to methylene chloride (MC) in 2008, however their equipment can still be operated with HCFC-141b. The sector distribution of HCFCs in Cameroon in 2010 is presented in Table 2.

Table 2. Sector distribution of HCFC consumption in Cameroon (2010)

Application	Metric tonnes (mt)	ODP tonnes
(HCFC-22)		
Refrigeration and air-conditioning servicing	1,070.62	58.88
Commercial refrigeration manufacturing	26.62	1.46
Refrigeration and air-conditioning manufacturing	64.48	3.55
Purging and cleaning	59.30	3.26
Total HCFC-22	1,221.02	67.16
(HCFC-141b)		
PU rigid foam pipes	65.93	7.25
PU rigid foam commercial refrigeration	46.99	5.17
Solvent and degrease	32.09	3.53
Total HCFC-141b	145.01	15.95
Total HCFCs	1,366.03	83.10

8. The forecast of HCFC consumption in 2011-2020 is shown in Table 3.

Table 3. 2011-2020 forecast of HCFC consumption

YEAR		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
With constraint	MT	1,391	1,416	1,356	1,356	1220	1220	1220	1220	1220	881
	ODP	85.0	86.0	82.4	82.4	74.2	74.2	74.2	74.2	74.2	53.6
Without constraint	MT	1,391	1,416	1,441	1,467	1,493	1,520	1,548	1,576	1,604	1,633
	ODP	85.0	86.0	88.0	89.0	91.0	92.0	94.0	96.0	98.0	99.0

9. The current prices of HCFCs and alternative refrigerants per kilogram in the country are: US $5.88 for HCFC-22, US $10.29 for HFC-134a; US $11.93 for R-404A; US $13.27 for R-407C; and US $10.77 for R-600A (isobutane).

HCFC phase-out strategy

10. The Government's HCFC phase-out strategy is aligned with the Montreal Protocol phase-out schedule. During stage I, the HPMP proposes to freeze HCFC consumption to the estimated baseline level of 82.4 ODP tonnes in 2013, and to gradually reduce its HCFC consumption by 28.9 ODP tonnes from the baseline to meet the 35 per cent reduction by 2020. In line with this strategy, the Government is proposing to implement the following activities:

(a) Policy instruments to control the supply and demand of HCFCs;

(b) Non-investment component;

(c) Investment project to phase out the use of HCFC-22 in the refrigeration manufacturing sector;

(d) Investment project to phase out the use of HCFC-141b in pipe insulation;

(e) Investment project to phase out the use of HCFC-141b in flexible foam; and

(f) Assistance to the refrigeration and air-conditioning servicing sector.

Policy instruments to control the supply and demand of HCFCs, and non-investment component

11. These two components are intended to improve existing regulations to ensure better control of HCFCs. It includes, among others, the introduction of HCFC import quotas, labeling of HCFCs containers and equipment, refrigeration technician registration, ban on import of equipment containing HCFCs by 2013, and ban on manufacturing equipment and installation of new HCFC based refrigeration and air-conditioning equipment by 2013. It will also improve the custom tariff system, custom training, capacity building, and awareness activities.

Investment project in the refrigeration manufacturing sector

12. The activity proposes the phase-out of 88 mt (4.84 ODP tonnes) of HCFC-22 used by twelve small and medium-sized companies in the manufacturing of refrigeration and air-conditioning equipment and 59 mt (3.24 ODP tonnes) of HCFC-22 used in the manufacturing process for cleaning and degreasing. The HCFC consumption phase-out by these companies represents a reduction of 8.0 ODP tonnes of HCFC-22. The alternatives selected are HFC-410A and HFC-407C. The conversion involves: providing charging equipment for HFC-410A, manifolds and gauges, additional scales, electronic leak detectors, high efficiency vacuum pumps, stationary gas detection systems, performance measuring and

calibration systems, nitrogen pressure test equipment, recovery machines, refrigerant analyzers, tools, technical assistance, spares, delivery, insurance and installation.

Investment project to phase out the use of HCFC-141b in pipe insulation

13. The activity proposes the phase-out of 70.9 mt (7.81 ODP tonnes) of HCFC-141b used by six rigid polyurethane pipe insulation manufacturing companies; three of them are also producing rigid insulation panels for commercial refrigeration. The HCFC consumption phase-out by these companies represents a reduction of 7.81 ODP tonnes of Cameroon's consumption (7.26 ODP tonnes used in pipes and 0.55 ODP tonnes used as solvent). Out of the 7.81 ODP tonnes of HCFC-141b to be eliminated, 5.1 ODP tonnes are contained in imported pre-blended polyols to be reported as consumption in 2010. The technology selected for the conversion is methyl formate for the pipe insulation manufacturing and blends which could contain HFCs, degreasing agents or hydrocarbons for cleaning purposes. The conversion involves the basic portable low-pressure foam machines for *in-situ* injection, spares, delivery, insurance, training, commissioning, and incremental operational costs for the use of new systems based on methyl formate.

Investment project to phase out the use of HCFC-141b in flexible foam

14. This activity proposes assistance to three companies that converted from HCFC-141b to MC in the production of flexible slabstock foam. The activity proposes modifications to the plant for the safe handling of MC including storage tanks, ventilation systems, one batch foam machine, safety equipments, and MC metering and pumping systems. It also includes partial compensation for incremental operational costs incurred in the introduction of MC. The activity does not have any direct HCFC reduction associated; instead it is proposed to ensure that the conversion from HCFC-141b to MC undertaken by the companies is sustainable and safe. During their last three years of production (2006-2008), these companies consumed together 20 mt of HCFC-141b per year.

Assistance to the refrigeration and air-conditioning servicing sector

15. The HPMP proposes to support the service sector by implementing an emission reduction programme, encouraging good practice and recovery and recycling, and establishing a national refrigerant recovery and reclamation scheme accessible to all service companies and end-users. This activity includes a national reclaim facility based on reclamation plants at two cities: Douala and Garoua. A national scheme backed by formal quality control and product certification is proposed to prevent poor quality refrigerant being distributed by uncertified suppliers that would create a disincentive for technicians to use recycled refrigerants. The reclaim scheme would build on the lessons learned in implementing some recovery and recycling activities under the refrigerant management plan (RMP) and terminal phase-out management plan (TPMP) and will be supported by the policy component.

Cost of the HPMP

16. The total cost of stage I of the HPMP has been estimated at US $2,479,196, resulting in the phase-out of 28.9 ODP tonnes of HCFCs. The detailed cost breakdown is presented in Table 4.

Table 4. Total cost of stage I of the HPMP Cameroon

Component	Budget (US $)
Policy instruments	125,000
Non investment activities	240,000
Phasing out HCFC-22 in RAC Manufacturing	804,696
Phasing out HCFC-141b in Rigid PU pipe insulation	415,900
Investment methylene chloride for flexible foam	350,000
Servicing sector activities	543,600
Total	**2,479,196**

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

17. The Secretariat reviewed the HPMP for Cameroon in the context of the guidelines for the preparation of HPMPs (decision 54/39), the criteria for funding HCFC phase-out in the consumption sector agreed at the 60th meeting (decision 60/44), subsequent decisions on HPMPs made at the 62nd and 63rd meetings and the 2011-2014 business plan of the Multilateral Fund.

HPMP targets

18. The Secretariat drew UNIDO's attention to the fact that the currently estimated baseline of 1,458.5 mt being higher than 360 mt moves Cameroon to the category of a non-low-volume-consuming (non-LVC) country, where eligible funding under decision 60/44 is available only to meet the 2015 reduction targets. It was subsequently agreed that the stage I of the HPMP of Cameroon will address up to the 10 per cent reduction by 2015.

HCFC data discrepancies

19. The Secretariat noted the discrepancies between the HCFC data reported under Article 7 and that gathered in the survey used for the preparation of the HPMP. UNIDO explained that the reported consumption figures between 2005 and 2008 were lower than the ones in the survey due to deficiencies in the customs tariff structures and the import monitoring process, which failed to record HCFC based refrigerants and HCFCs contained in pre-blended polyols. In 2009, the data reported under Article 7 (104.2 ODP tonnes) was higher than that in the survey (81.7 ODP tonnes) as the use of MC in flexible foams was mistakenly recorded as HCFC-141b consumption. As a result, the estimated HCFC baseline for compliance based on the consumption data reported under Article 7 (93.7 ODP tonnes) is higher than the one estimated by the country in the HPMP (82.4 ODP tonnes). An official request will be sent by the Government of Cameroon to the Ozone Secretariat to adjust the 2005-2009 reported Article 7 data as per the data gathered during the preparation of the HPMP[1].

Starting point for aggregate reduction in HCFC consumption

20. The Government of Cameroon agreed to establish as its starting point for sustained aggregate reductions in HCFC consumption the average level of consumption of 81.7 ODP tonnes in 2009 and 83.1 ODP tonnes in 2010, which had been estimated at 82.4 ODP tonnes based on the information gathered in

[1]The Ozone Secretariat had informed the Fund Secretariat that since HCFC consumption for 2009 is used to calculate the baseline for compliance for Article 5 Parties, any revision to the reported data should follow the methodology for the revision of baseline data adopted by the Parties to the Montreal Protocol at their 15th meeting (decision XV/19) (i.e., the request should be submitted for consideration by the Implementation Committee).

the preparation of the HPMP. The business plan indicated a baseline of 108.4 ODP tonnes, which is based on the data reported under Article 7 for 2009 (104.2 ODP tonnes) that mistakenly included MC imports as HCFC-141b consumption, and is therefore higher than the starting point.

Technical and cost-related issues associated with the refrigeration manufacturing sector

21. The Secretariat had raised with UNIDO the question whether the enterprises were to be considered as manufacturing, assembly or service. The information submitted by UNIDO and the discussions clarified that the enterprises need to be considered as performing the assembly of refrigeration and air-conditioning equipment. This renders them eligible for incremental capital cost, but not for incremental operating cost. The Secretariat also discussed with UNIDO the number of equipment items for the conversions of 12 companies, and the associated costs. UNIDO revised the overall costs based on comments by the Secretariat.

22. UNIDO had informed in the HPMP that 59.3 mt (3.26 ODP tonnes) of consumption in 2009 have been related to purging and cleaning in the refrigeration manufacturing/assembly sector; this amounts to about 40 per cent of the consumption for manufacturing/assembly. Similar figures were reported for 2008 and 2010. Evaporative uses of HCFC-22 such as purging and cleaning should be normally between 5 per cent and 10 per cent of the total, since refrigerant costs are high enough to suggest a moderate use of these substances because of cost reasons alone. UNIDO advised that the figure for purging and cleaning is a calculated value, which has been determined as the differential between the aggregated charge of the refrigeration units reported to have been produced, and the wholesalers information about the amount of refrigerant sold to companies performing manufacturing and assembly. Consequently, the amount sold includes also charges to equipment built but possibly not reported, and possible service use during manufacturing or aftersales. Under these circumstances, it appears meaningful to assume the combined figure to represent the phase-out achieved by the conversion, and the Secretariat and UNIDO have agreed to do so.

Technical and cost issues associated with the foam manufacturing sector

23. The Secretariat and UNIDO discussed technical, eligibility and cost-related issues linked to the conversion of six rigid polyurethane pipe insulation manufacturing companies. Based on the costs of equipment and materials required for the use of the methyl formate technology, the cost of the low-pressure dispensers was reduced from US $45,000 to US $15,000 per unit and the portion of the incremental operating cost funded by the Multilateral Fund was reduced from US $100,000 to US $66,000. UNIDO in explaining the status of technology supply, informed that a well established company from South Africa supplies a methyl formate based system that can be used in basic low-pressure foaming equipment providing at least matching thermal and physical properties to the hand blended polyurethane currently used. UNIDO confirmed that all potential safety related issues associated with the use of the selected technology have been fully considered in the proposal. Subsequent to the discussions on technical and cost issues related to the foam dispensers, the total cost of the activity was adjusted to US $214,900 to phase out 7.81 ODP tonnes with a cost effectiveness value of US $3.02/kg.

24. Three of the companies which are covered in the refrigeration project as well as the pipe insulation manufacturing project currently also produce HCFC-141b blown polyurethane foam for commercial refrigeration insulation; however no funding is requested to phase out this consumption. In response to a request by the Secretariat, UNIDO informed that the majority of commercial and larger refrigeration equipment manufactured in Cameroon use imported polystyrene insulation panels. Presently, the three companies produce rigid polyurethane insulation foam by hand mixing and/or by using locally adapted low-pressure foaming machines. These companies have agreed to phase out the use of 5.16 ODP tonnes of HCFC-141b by further adoption of polystyrene insulation where possible, and/or the use of the basic portable foaming equipment to be supplied primarily for production of pipe insulation. Consequently, the conversion of foam blowing at these companies will be carried out at no extra cost to

the Multilateral Fund except for any support which might be provided through the technical assistance activities. The overall impact of the rigid foams activity is therefore 12.96 ODP tonnes.

25. A project aimed at assisting three flexible foams manufacturing companies, which was individually submitted to the 63rd meeting and withdrawn, was also submitted as part of the HPMP. In answering issues raised by the Secretariat, UNIDO informed that the equipment was installed and commissioned for HCFC-141b but due to its high price the companies adapted it to MC. It was also adapted to allow the use of bulk HCFCs and pre-blended polyols. The level of HCFC-141b consumption by these companies could not be established with sufficient certainty. UNIDO and the Government of Cameroon expressed concern that the companies have not introduced adequate safety measures for the use of MC technology and advised that the equipment is technically capable of using pre-blended polyols containing HCFC-141b.

26. The Secretariat suggested that instead of proposing an investment activity, it might be meaningful to include these companies, together with other small and medium-sized enterprises using HCFC-141b in a technical assistance activity and not addressed in the investment activity. This activity is meant to assist them to achieve the phase-out of HCFC-141b in a sustainable and safe manner. It was agreed to include in the HPMP a technical assistance activity at a cost of US $96,000 to assist the users of HCFC-141b in bulk and pre-blended polyols to achieve the total phase-out of HCFC-141b by 2015. The Government of Cameroon has committed to banning imports of HCFC-141b in bulk and contained in pre-blended polyols by 1 January 2015.

Technical and cost issues associated with refrigeration servicing sector

27. The Secretariat reviewed the proposal on the refrigeration servicing sector in the context of the overall HPMP stage I strategy. The assistance for servicing was reduced from the original proposal as stage I will only cover up to 2015, and not 2020 as originally submitted, and there are two manufacturing sectors already included in stage I. The servicing sector activity will only include customs training, refrigeration training, and providing recovery equipment and leak detectors. The reclamation center originally requested was moved to stage II. The activities in stage I will be implemented in coordination with the implementation of the last tranche of the TPMP.

Revised overall cost of the HPMP stage I

28. The revised overall cost of the HPMP stage I is presented in Table 5. The Secretariat notes that the number of tonnes to be phased out is above the consumption required to be phased out under stage I (9.37 ODP tonnes, or 10 per cent of the baseline). However, the Secretariat also acknowledges that Cameroon has presented a very conservative scenario of consumption growth, has addressed the entire manufacturing sector in its stage I and has proposed achieving sustainable reductions at good cost effectiveness level. This is also the reason why the Secretariat believes that the implementation of this HPMP would require approval of all of its components.

Table 5. Revised overall cost of the HPMP stage I

Component	Impact (ODP tonnes)	Budget
Phasing out HCFC-141b in rigid PU pipe insulation	12.96	214,900
Technical assistance remaining companies using HCFC-141b	2.74	96,000
Phasing out HCFC-22 in RAC Manufacturing	8.00	570,825
Service Sector activities (including customs component)	1.65	176,000
Policy development and non-investment activities	N.A.	125,000
Total	**25.35**	**1,182,725**

Impact on the climate estimated by the Country in its HPMP

29. A calculation of the impact on the climate of the HCFC-141b to be phased out from the investment activity in the rigid polyurethane insulation manufacturing sector is as follows: 112.8 mt of HCFC-141b will be phased out, 56.5 mt of methyl formate will be phased in, and 80,659 CO_2-equivalent tonnes that would have been emitted into the atmosphere will have been avoided (Table 6).

Table 6. Calculation of the impact on the climate foams

Substance	**GWP**	**Tonnes/year**	**CO_2-eq (tonnes/year)**
Before conversion			
HCFC-141b foams – pipes and commercial units	725	112.8(*)	81,787
After conversion			
Methyl formate - pipes	20	56.5	1,128
Net impact			-(80,659)

(*) Additional 5 mt addressed by this project for cleaning are not included in the calculation of impact in the climate

30. A calculation of the impact on the climate of the HCFC-22 to be phased out from the investment activity in the refrigeration and air-conditioning manufacturing sector is as follows: by replacing HCFC-22 with HFC-410A in the manufacturing of refrigeration and air-conditioning units in Cameroon, climate impact per unit over life time increases an average of 5.7 per cent in commercial refrigeration units and an average of 6.2 per cent per unit in air-conditioning units (Table 7).

Table 7. Calculation of the impact on the climate refrigeration

Input				
	Generic			
	Country	[-]	**Cameroon**	
	Company data (name, location)	[-]	**Various commercial**	**Various A/C**
	Select system type	[list]	Commercial refrigeration / cooling / on-site assembly	Air conditioning / on-site assembly
	General refrigeration information			
	HCFC to be replaced	[-]	HCFC-22	HCFC-22
	Amount of refrigerant per unit	[kg]	between 0.6 and 20, av. 2.81	between 1 and 2.5, av. 1.45
	No. of units	[-]	22,513	17,635
	Refrigeration capacity	[kW]	between 1.95 and 75, av. 8.13	between 3.15 and 9.1, av. 4.85
	Selection of alternative with minimum environmental impact			
	Share of exports (all countries)	[per cent]	0	0
	Calculation of the climate impact			
	Alternative refrigerant (more than one possible)	[list]	HFC-410A; HC-290	HFC-410A; HC-290

NOTE
All data displayed is specific to the case investigated and is not generic information about the performance of one alternative; performance can differ significantly depending on the case.

Output	*Note: The output is calculated as the climate impact of the refrigerant systems in their life time as compared to HCFC-22, on the basis of the amount produced within one year. Additional/different outputs are possible.*			
	Country			**Cameroon**
	Identification of the alternative technology with minimum climate impact			
	List of alternatives for identification of the one with minimum climate impact	[Sorted list, best = top (per cent deviation from HCFC)]	HC-600a (-24.0 per cent)	HC-600a (-24.3 per cent)
			HC-290 (-20.1 per cent)	HC-290 (-20.0 per cent)
			HFC-134a (-5.8per cent)	HFC-134a (-6.2 per cent)
			HCFC-22	HFC-407C (-0.1 per cent)
			HFC-407C (2.2 per cent)	**HCFC-22**
			HFC-410A (5.7 per cent)	HFC-410A (6.2 per cent)
			HFC-404A (22.7 per cent)	HFC-404A (21.8 per cent)
	Calculation of the climate impact			
	Per unit, over lifetime (for information only):			
			HCFC-22	HCFC-22
	Energy consumption	[kWh]	131,415	24,114
	Direct climate impact (substance)	[kg CO2 equiv]	21,209	3,858
	Indirect climate impact (energy): In country	[kg CO2 equiv]	88,048	16,157
	Indirect climate impact (energy): Global average	[kg CO2 equiv]	0	0
	Calculation of the climate impact of the conversion			
	Alternative refrigerant 1 – country's selection		**HFC-410A**	**HFC-410A**
	*Total direct impact (post conversion – baseline)**	*[t CO2 equiv]*	*12,912*	*1,840*
	*Indirect impact (country)***	*[t CO2 equiv]*	*126,277*	*19,875*
	*Indirect impact (outside country)***	*[t CO2 equiv]*	*0*	*0*
	Total indirect impact	*[t CO2 equiv]*	*126,277*	*19,875*
	Total impact	**[t CO2 equiv]**	**139,189**	**21,715**
	Alternative refrigerant 2		**HC-290**	**HC-290**
	*Total direct impact (post conversion – baseline)**	*[t CO2 equiv]*	*-475,299*	*-67,725*
	*Total indirect impact (country)***	*[t CO2 equiv]*	*-19,061*	*-2,729*
	*Total indirect impact (outside country)***	*[t CO2 equiv]*	*0*	*0*
	*Total indirect impact***	*[t CO2 equiv]*	*-19,061*	*-2,729*
	Total impact	**[t CO2 equiv]**	**-494,360**	**-70,454**

*Direct impact: Different impact between alternative technology and HCFC technology for the substance-related emissions.

**Indirect impact: Difference in impact between alternative technology and HCFC technology for the energy-consumption-related emissions of CO2 when generating electricity.

31. The proposed technical assistance activities in the HPMP, which include the introduction of better servicing practices and enforcement of HCFC import controls, will reduce the amount of HCFC-22 used for refrigeration servicing. Each kilogram (kg) of HCFC-22 not emitted due to better refrigeration practices results in the savings of approximately 1.8 CO_2-equivalent tonnes saved. Although a calculation of the impact on the climate was not included in the HPMP, the activities planned by Cameroon, in particular its strong reliance on the use of HFC in its replacement strategy indicate that it is likely that the

country will not achieve the 79,080 CO_2-equivalent tonnes emission reductions into the atmosphere estimated in the 2011-2014 business plan. However, at this time, the Secretariat is not in a position to quantitatively estimate the impact on the climate. The impact might be established through an assessment of implementation reports by, *inter alia*, comparing the levels of refrigerants used annually from the commencement of the implementation of the HPMP, the reported amounts of refrigerants being recovered and recycled, the number of technicians trained and the HCFC-22 based equipment being retrofitted.

32. The overall effect of the HPMP on the climate could be estimated by adding the impact of its three main components – foams manufacturing, refrigeration and air-conditioning manufacturing, and refrigeration and air-conditioning servicing. In the case of Cameroon, this is challenging since the impact in the servicing sector remains unknown; however, the combined impact of the foams and refrigeration/air-conditioning manufacturing sectors with an increase in emissions by 80,245 CO_2 equivalent tonnes will probably be further enhanced by the additional emissions in the servicing sector.

Co-financing

33. In response to decision 54/39(h) on potential financial incentives and opportunities for additional resources to maximize the environmental benefits from HPMPs pursuant to paragraph 11(b) of decision XIX/6 of the Nineteenth meeting of the Parties, UNIDO explained that in-kind co-financing was considered by the private companies, it includes the voluntary phase out of HCFC-141b in the manufacturing of foams for the commercial refrigeration sector.

2011-2014 business plan of the Multilateral Fund

34. UNIDO is requesting US$1,182,725 plus support costs for implementation of stage I of the HPMP. The total value requested for the period 2011-2014 of US $1,144,287 including support cost is within that in the business plan.

Draft Agreement

35. A draft Agreement between the Government of Cameroon and the Executive Committee for HCFCs phase-out is contained in Annex I to the present document.

RECOMMENDATION

36. The Executive Committee may wish to consider:

(a) Approving, in principle, stage I of the HCFC phase-out management plan (HPMP) for Cameroon for the period 2011 to 2015, at the amount of US $1,182,725, plus agency support costs of US $88,704 for UNIDO;

(b) Noting that the Government of Cameroon had agreed to establish as its starting point for sustained aggregate reduction in HCFC consumption, the estimated baseline of 82.4 ODP tonnes calculated as the average estimated consumption of 81.7 ODP tonnes for 2009 and estimated consumption of 83.1 ODP tonnes for 2010;

(c) Deducting 25.4 ODP tonnes of HCFCs from the starting point for sustained aggregate reduction in HCFC consumption;

(d) Approving the draft Agreement between the Government of Cameroon and the Executive Committee for the reduction in consumption of HCFCs, as contained in Annex I to the present document;

(e) Requesting the Fund Secretariat, once the baseline data were known, to update Appendix 2-A to the Agreement to include the figures for maximum allowable consumption, and to notify the Executive Committee of the resulting change in the levels of maximum allowable consumption and of any potential related impact on the eligible funding level, with any adjustments needed being made when the next tranche was submitted; and

(f) Approving the first tranche of stage I of the HPMP for Cameroon, and the corresponding implementation plan, at the amount of US $884,453, plus agency support costs of US $66,334 for UNIDO.

Annex I

DRAFT AGREEMENT BETWEEN THE GOVERNMENT OF THE REPUBLIC OF CAMEROON AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROFLUOROCARBONS

1. This Agreement represents the understanding of the Government of the Republic of Cameroon (the "Country") and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A ("The Substances") to a sustained level of 74.2 ODP tonnes by 1 January 2015 in compliance with Montreal Protocol schedules, with the understanding that this figure is to be revised one single time, once the baseline consumption for compliance has been established based on Article 7 data.

2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A ("The Targets and Funding") in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances which exceeds the level defined in row 1.2 of Appendix 2-A (maximum allowable total consumption of Annex C, Group I substances) as the final reduction step under this agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances which exceeds the level defined in rows 4.1.3 and 4.2.3 (remaining eligible consumption).

3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees in principle to provide the funding set out in row 3.1 of Appendix 2-A (the "Targets and Funding") to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A (the "Funding Approval Schedule").

4. The Country will meet the consumption limits for each of the Substances as indicated in Appendix 2-A. It will also accept independent verification, to be commissioned by the relevant bilateral or implementing agency, of achievement of these consumption limits as described in sub-paragraph 5(b) of this Agreement.

5. The Executive Committee will not provide the Funding in accordance with the Funding Approval Schedule unless the Country satisfies the following conditions at least 60 days prior to the applicable Executive Committee meeting set out in the Funding Approval Schedule:

(a) That the Country has met the Targets for all relevant years. Relevant years are all years since the year in which the hydrochloroflurocarbon phase-out management plan (HPMP) was approved. Exempt are years for which no obligation for reporting of country programme data exists at the date of the Executive Committee Meeting at which the funding request is being presented;

(b) That the meeting of these Targets has been independently verified, except if the Executive Committee decided that such verification would not be required;

(c) That the Country had submitted tranche implementation reports in the form of Appendix 4-A (the "Format of Tranche Implementation Report and Plan") covering each previous calendar year, that it had achieved a significant level of implementation of activities initiated with previously approved tranches, and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent; and

(d) That the Country has submitted and received approval from the Executive Committee for a tranche implementation plan in the form of Appendix 4-A (the "Format of Tranche Implementation Reports and Plans") covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen.

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A (the "Monitoring Institutions and Roles") will monitor and report on Implementation of the activities in the previous tranche implementation plan in accordance with their roles and responsibilities set out in Appendix 5-A. This monitoring will also be subject to independent verification as described in sub-paragraph 5(b).

7. The Executive Committee agrees that the Country may have the flexibility to reallocate the approved funds, or part of the funds, according to the evolving circumstances to achieve the smoothest phase-down and phase-out of the Substances specified in Appendix 1-A. Reallocations categorized as major changes must be documented in advance in a Tranche Implementation Plan and approved by the Executive Committee as described in sub-paragraph 5(d). Major changes would relate to reallocations affecting in total 30 per cent or more of the funding of the last approved tranche, issues potentially concerning the rules and policies of the Multilateral Fund, or changes, which would modify any clause of this Agreement. Reallocations not categorized as major changes may be incorporated in the approved Tranche Implementation Plan, under implementation at the time, and reported to the Executive Committee in the Tranche Implementation Report. Any remaining funds will be returned to the Multilateral Fund upon closure of the last tranche of the plan.

8. Specific attention will be paid to the execution of the activities in the refrigeration servicing sub-sector, in particular:

(a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation; and

(b) The Country and the bilateral and implementing agencies involved will take full account of the requirements of decisions 41/100 and 49/6 during the implementation of the plan.

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfill the obligations under this Agreement. UNIDO has agreed to be the single lead implementing agency (the "Lead IA") in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of any of the agencies taking part in this Agreement.

10. The Lead IA will be responsible for carrying out the activities of the overall plan with the changes approved as part of the subsequent submissions, including but not limited to independent verification as per sub-paragraph 5(b). The Executive Committee agrees, in principle, to provide the Lead IA with the fees set out in row 2.2 of Appendix 2-A.

11. Should the Country, for any reason, not meet the Targets for the elimination of the Substances set out in row 1.2 of Appendix 2-A or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding in accordance with the Funding Approval Schedule. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amount set out in Appendix 7-A in respect of each ODP kg of

reductions in consumption not achieved in any one year. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once these decisions are taken, this specific case will not be an impediment for future tranches as per paragraph 5 above.

12. The Funding of this Agreement will not be modified on the basis of any future Executive Committee decision that may affect the funding of any other consumption sector projects or any other related activities in the Country.

13. The Country will comply with any reasonable request of the Executive Committee, and the Lead IA to facilitate implementation of this Agreement. In particular, it will provide the Lead IA with access to information necessary to verify compliance with this Agreement.

14. The completion of the HPMP and the associated Agreement will take place at the end of the year following the last year for which a maximum allowable total consumption has been specified in Appendix 2-A. Should at that time activities be still outstanding which were foreseen in the Plan and its subsequent revisions as per sub-paragraph 5(d) and paragraph 7, the completion will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per sub-paragraphs 1(a), 1(b), 1(d), and 1(e) of Appendix 4-A continue until the time of the completion if not specified by the Executive Committee otherwise.

15. All of the conditions set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

APPENDICES

APPENDIX 1-A: THE SUBSTANCES

Substance	Annex	Group	Starting point for aggregate reductions in consumption (ODP tonnes)
HCFC-22	C	I	66.7
HCFC-141b	C	I	15.7
Total			82.4

APPENDIX 2-A: THE TARGETS, AND FUNDING

		2011	2012	2013	2014	2015	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	n/a		93.7	93.7	84.3	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	n/a		82.4	82.4	74.2	n/a
2.1	Lead IA UNIDO agreed funding (US $)	884,453	0	180,000	0	118,272	1,182,725
2.2	Support costs for Lead IA (US $)	66,334	0	13,500	0	8,870	88,704
3.1	Total agreed funding (US $)	884,453	0	180,000	0	118,272	1,182,725
3.2	Total support cost (US $)	66,334	0	13,500	0	8,870	88,704
3.3	Total agreed costs (US $)	950,787	0	193,500	0	127,142	1,271,429
4.1.1	Total phase-out of HFCF-22 agreed to be achieved under this agreement (ODP tonnes)						9.6
4.1.2	Phase-out of HFCF-22 to be achieved in previously approved projects (ODP tonnes)						N/A
4.1.3	Remaining eligible consumption for HFCF-22 (ODP tonnes)						57.1
4.2.1	Total phase-out of HFCF-141b agreed to be achieved under this agreement (ODP tonnes)						15.7
4.2.2	Phase-out of HFCF-141b to be achieved in previously approved projects (ODP tonnes)						0
4.2.3	Remaining eligible consumption for HFCF-141b (ODP tonnes)						0

APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval not earlier than the last meeting of the year specified in Appendix 2-A.

APPENDIX 4-A: FORMAT OF IMPLEMENTATION REPORTS AND PLANS

1. The submission of the Implementation Report and Plan for each tranche request will consist of five parts:

(a) A narrative report regarding the progress in the previous tranche, reflecting on the situation of the Country in regard to phase out of the Substances, how the different activities contribute to it and how they relate to each other. The report should further highlight successes, experiences and challenges related to the different activities included in the Plan, reflecting on changes in the circumstances in the country, and providing other relevant information. The report should also include information about and justification for any changes vis-à-vis the previously submitted tranche plan, such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes. The narrative report will cover all

relevant years specified in sub-paragraph 5(a) of the Agreement and can in addition also include information about activities in the current year;

(b) A verification report of the HPMP results and the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement. If not decided otherwise by the Executive Committee, such a verification has to be provided together with each tranche request and will have to provide verification of the consumption for all relevant years as specified in sub-paragraph 5(a) of the Agreement for which a verification report has not yet been acknowledged by the Committee;

(c) A written description of the activities to be undertaken until the planned submission of the next tranche request, highlighting their interdependence, and taking into account experiences made and progress achieved in the implementation of earlier tranches. The description should also include a reference to the overall Plan and progress achieved, as well as any possible changes to the overall plan foreseen. The description should cover the years specified in sub-paragraph 5(d) of the Agreement. The description should also specify and explain any revisions to the overall plan which were found to be necessary;

(d) A set of quantitative information for the report and plan, submitted into a database. As per the relevant decisions of the Executive Committee in respect to the format required, the data should be submitted online. This quantitative information, to be submitted by calendar year with each tranche request, will be amending the narratives and description for the report (see sub-paragraph 1(a) above) and the plan (see sub-paragraph 1(c) above), and will cover the same time periods and activities; it will also capture the quantitative information regarding any necessary revisions of the overall plan as per sub-paragraph 1(c) above. While the quantitative information is required only for previous and future years, the format will include the option to submit in addition information regarding the current year if desired by the country and lead implementing agency; and

(e) An Executive Summary of about five paragraphs, summarizing the information of above sub-paragraphs 1(a) to 1(d).

APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES

1. The National Ozone Unit (NOU) is the central administrative unit established within the administrative structure of the Ministry of Environment of Cameroon, responsible for the coordination of governmental activities with respect to the ozone layer protection and facilitation of ODS phase-out.

2. The NOU within the Ministry of Environment of Cameroon will be responsible for the overall coordination of national activities towards the HPMP Phase-out Plan implementation.

3. The management of the implementation of the planned project activities will be allocated to the NOU in cooperation with UNIDO as the Lead IA.

APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY

1. The Lead IA will be responsible for a range of activities. These can be specified in the project document further, but include at least the following:

(a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's HPMP;

(b) Assisting the Country in preparation of the Implementation Plans and subsequent reports as per Appendix 4-A;

(c) Providing verification to the Executive Committee that the Targets have been met and associated annual activities have been completed as indicated in the Tranche Implementation Plan consistent with Appendix 4-A;

(d) Ensuring that the experiences and progress is reflected in updates of the overall Plan and in future Tranche Implementation Plans consistent with sub-paragraphs 1(c) and 1(d) of Appendix 4-A;

(e) Fulfilling the reporting requirements for the tranches and the overall Plan as specified in Appendix 4-A as well as project completion reports for submission to the Executive Committee.

(f) Ensuring that appropriate independent technical experts carry out the technical reviews;

(g) Carrying out required supervision missions;

(h) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;

(i) In case of reductions in funding for failure to comply in accordance with paragraph 11 of the Agreement, to determine, in consultation with the Country, the allocation of the reductions to the different budget items and to the funding of each implementing or bilateral agency involved;

(j) Ensuring that disbursements made to the Country are based on the use of the indicators; and

(k) Providing assistance with policy, management and technical support when required.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent organization to carry out the verification of the HPMP results and the consumption of the substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement and sub-paragraph 1(b) of Appendix 4-A.

APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY

1. In accordance with paragraph 11 of the Agreement, the amount of funding provided may be reduced by US $93 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target specified in row 1.2 of Appendix 2-A has not been met.